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PROBLEMS FOR SOLUTION.

ARITHMETIC.

156. Proposed by JAMES F. LAWRENCE, A. B., Professor of Mathematics, Rogers Academy, Rogers, Ark.

Suppose that in a meadow the grass is of uniform quality and growth, and that 6 oxen or 10 colts could eat up 3 acres of pasture in 18-25 of the time in which 10 oxen and 6 colts could eat up 8 acres; or that 600 sheep would require 2 6-7 weeks longer than 660 sheep to eat 9 acres. In what time could 1 ox, 1 colt, and 1 sheep eat up 1 acre of pasture, on the supposition that 588 sheep eat as much in a week as 6 oxen and 11 colts?

157. Proposed by B.F.FINKEL, A. M., M.Sc., Professor of Mathematics and Physics, Drury College, Springfield, Mo.

January 1, 1899, A and B entered into partnership for 3 years. A put in \$10,000 and B put in \$5,500. July 1, 1899, B put in \$1,500 more. October 1, A took out \$500. January 1, 1900, each put in \$1,500. July 1, 1900, they dissolved partnership, and found that they had lost \$846. What is each partner's share of the loss?

ALGEBRA.

159. Proposed by W. J. GREENSTREET, M. A., Editor of The Mathematical Gazette, Stroud, Gloucestershire, England.

If $x-1=3m$, $x^2-1=4n$, $x^3-1=5p$, where m, n, p are integers, find a general expression for x .

151. Proposed by J. SCHEFFER, A. M., Hagerstown, Md.

Represent the square root of $10+2\sqrt{6}+2\sqrt{10}+2\sqrt{15}$ as the sum of three square roots.

152. Proposed by W. J. GREENSTREET, M. A., Editor of The Mathematical Gazette, Stroud, Gloucestershire, England.

If n quantities are made up of q sets of r each, find the number of permutations s at a time. It is supposed that the quantities in each set are alike, but different from those in the other sets.

GEOMETRY.

184. Proposed by ERWIN MARTIN, Principal of Schools, Mead, Neb.

If from any point in the circumference of a circle circumscribed about a triangle, perpendiculars are drawn to the sides, or the sides produced, of the inscribed triangle, the lines connecting the feet of the perpendiculars are collinear.

185. Proposed by W. J. GREENSTREET, M. A., Editor of The Mathematical Gazette, Stroud, Gloucestershire, England.

Given the tangential equations to two conics S, S' , find the tangential co-ordinates of the join of the poles of two given parallel lines with respect to S . Deduce the tangential equation of the center of S , and find that of the intersection of S and S' .